

93 Stiles Road, Suite 201, Salem, New Hampshire 03079 USA
800 Turnpike Street, Suite 300, North Andover, Massachusetts 01845 USA
Phone (603) 212-9133 and Fax (603) 226-4108
Email tepp@teppllc.com and Web www.teppllc.com

Ref: 1110
Subject: Traffic Assessment
Proposed Residential Redevelopment
Lexington, Massachusetts
From: Kim Eric Hazarvartian, Ph.D., P.E., PTOE
Principal
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INTRODUCTION

TEPP LLC has prepared this traffic assessment of the proposed residential redevelopment at 509 Woburn Street in the Town of Lexington, Massachusetts. The existing site:

- is on the south side of Woburn Street west of and at the Woburn city line
- includes one single-family detached house with a driveway to Woburn Street, to be removed

The proposed redevelopment will:

- consist of 52 residential condominium dwelling units with one to two bedrooms each
- have vehicle access via the existing 425 Woburn Street driveway

425 Woburn Street is comprised of 33 residential condominium units.

WOBURN STREET

Woburn Street near the site:¹

- is an collector street under the jurisdiction of the Commonwealth of Massachusetts
- has a relatively level vertical alignment that includes minor grades
- has a horizontal alignment with a combination of tangents and gentle curves
- has a travelway about 40 feet (ft) wide providing one travel lane about 12 ft wide and one shoulder about 8 ft wide per direction

¹ TEPP LLC conducted a field assessment on January 4, 2010.

- has pavement markings including a double-yellow line separating opposing traffic and white lines delineating shoulders
- has ACC pavement in good to fair condition
- has vertical granite curb and an asphalt cement concrete (ACC) sidewalk about 5 ft wide on the north side and an ACC Cape Cod berm on the south side
- has a posted speed limit of 35 miles per hour (mph)

Located along Woburn Street are:

- utility poles along the north side, some with luminaires
- a culvert, with W-beam guardrails, to the west of the 425 Woburn Street driveway
- residential development

425 WOBURN STREET DRIVEWAY

The 425 Woburn Street driveway, near Woburn Street:

- has a level vertical alignment is essentially level
- has a horizontal alignment that is tangent
- has a travelway about 24 ft wide providing one travel lane per direction
- has no pavement marking
- has ACC pavement in generally good condition
- has vertical Portland cement concrete curb on both sides and an ACC sidewalk about 4 ft wide on the west side
- has no posted speed limit

WOBURN STREET/425 WOBURN STREET DRIVEWAY INTERSECTION

The Woburn Street/425 Woburn Street driveway intersection:

- has a T configuration
- has Woburn Street as the major east-west street
- has 425 Woburn Street driveway as the minor south leg
- has single-lane approaches and departures

- operates with the 425 Woburn Street driveway northbound approach stopping (no STOP sign exists)
- is illuminated

EXISTING TRAFFIC VOLUMES

TEPP LLC researched traffic counts published by the Massachusetts Department of Transportation. The most recent year for Woburn Street east of Lowell Street was 2004, with an average daily traffic of about 6,800 vehicles (total of both directions).²

SIGHT DISTANCES

AASHTO has established the authoritative policy for sight distances at unsignalized intersections. SSD is considered at unsignalized intersections. SSD provides for safety and is fundamental to intersection operation. SSD enables a driver, on the major road, to perceive and react accordingly to a vehicle entering the major road from a minor road. SSD is conservative because it encompasses a wide range of brake-reaction times and deceleration rates.³

TEPP LLC measured relevant available sight distances at the Woburn Street/425 Woburn Street driveway intersection, as Table 1 summarizes. The table shows that available sight distances exceed AASHTO SSD⁴ for major-street approach speeds greater than the posted speed limit. Sight lines should be maintained to prevent inappropriate roadside obstructions or vegetation.

Table 1. Sight distances.

Direction	SSD (ft) for Major-Street Speed ^a			Available Sight Distance (ft)
	35 mph	40 mph	45 mph	
To/From the West	250	305	360	360±
To/From the East	250	305	360	530±

^aThe posted speed limit is 35 mph.

² Downloaded from www.mhd.state.ma.us on January 4, 2010

³ AASHTO, *A Policy on Geometric Design of Highways and Streets*, Fifth Edition (Washington, DC, 2004), page 651.

⁴ AASHTO, page 112.

BACKGROUND TRAFFIC GROWTH

Woburn Street continues eastward into the City of Woburn as Lexington Street.

TEPP LLC understands that the two following two developments are planned along the south side of Lexington Street:

- immediately east of the redevelopment site, eight townhouse units
- immediately east of the latter site, the Winning Farms development of about 150 residential condominium units

These two developments represent background traffic growth independent of the proposed redevelopment.

Coler & Colantonio, Inc. prepared the traffic impact report for the Winning Farms development.⁵ The report demonstrated no significant impact due to the Winning Farms development.⁶

TRIP GENERATION

The Institute of Transportation Engineers (ITE) compiles and publishes trip-generation information for a variety of land uses in *Trip Generation*.⁷ This authoritative guide for estimating site traffic includes the following:

- residential condominium (land use 230), based on dwelling units⁸
- single-family-detached housing (land use 210) based on dwelling units⁹

Table 2 presents calculated net changes in trip generation due to the proposed redevelopment as follows:

- 303 vehicle-trips per weekday (total of in and out)
- 23 vehicle-trips during the weekday AM street peak hour (3 in and 20 out)
- 28 vehicle-trips during the weekday PM street peak hour (18 in and 10 out)
- 285 vehicle-trips per Saturday (total of in and out)
- 23 vehicle-trips during the Saturday peak hour (13 in and 10 out)

⁵ Coler & Colantonio, Inc., *Traffic Impact Report, Winning Farms Trust, Woburn, Massachusetts* (Norwell, Massachusetts, February 2001).

⁶ Coler & Colantonio, Inc., page 19.

⁷ ITE, *Trip Generation*, 8th Edition (Washington DC, 2008).

⁸ ITE, *Trip Generation*, 8th Edition, pages 387 through 394.

⁹ ITE, *Trip Generation*, 8th Edition, pages 289 through 296.

Table 2. Trip generation.

Period	Calculated Vehicle-Trips			
	Residential Condominium		Existing House	Net Change
	33 Units ^a	85 Units ^a		
Weekday Daily	245	558	-10	303
Weekday AM Street Peak Hour				
In	4	7	-0	3
Out	17	38	-1	20
Total	21	45	-1	23
Weekday PM Street Peak Hour				
Enter	16	35	-1	18
Exit	8	18	-0	10
Total	24	53	-1	28
Saturday Daily	187	482	-10	285
Saturday Peak Hour				
Enter	8	22	-1	13
Exit	8	18	-0	10
Total	16	40	-1	23

^aBased on ITE, *Trip Generation*, 8th Edition, land use 230, residential condominium/townhouse.

^aBased on ITE, *Trip Generation*, 8th Edition, land use 210, single-family detached housing.

POTENTIAL TRAFFIC IMPACTS

ITE suggests that land developments generating at least 100 peak-hour vehicle trips, in the busier direction, are candidates for consideration of traffic impact analysis.¹⁰ The calculated peak-hour trip generation of the proposed development falls well below this level.

The highest peak-hour net change in trip generation is 28 vehicle-trips, which represents:

- an average of less than one vehicle per two minutes added to Woburn Street total
- an average of less than one vehicle per eight minutes added to Woburn Street eastbound or westbound east or west of the 425 Woburn Street driveway

¹⁰ ITE, *Manual of Transportation Engineering Studies* (Prentice Hall: Englewood Cliffs, New Jersey, 2000), page 144.

On these bases, the proposed redevelopment is anticipated to result in:

- no significant impact to area traffic operations and safety
- no significant impact to Woburn Street, which carries reasonable daily volumes for such a facility and will continue to carry reasonable daily volumes with both the two planned background developments and the proposed redevelopment
- no significant impact to the Woburn Street/Lowell Street signalized intersection that is about one-third mile west of the site

PEDESTRIANS

Sidewalks exist along the north side of Woburn Street and the west side of the 425 Woburn Street driveway. This requires pedestrians to cross Woburn Street at an intersection location with appropriate sight distances, as is desirable. The sidewalk along Woburn Street provides connections with the Lowell Street/Woburn Street intersection, to the west, and the City of Woburn, to the east.

BUSES

A school-bus stop exists on Woburn Street at the 425 Woburn Street driveway intersection. The general area may also be used for transit-bus stops. Sight distances are appropriate and Woburn Street has substantial paved shoulders.

CONCLUSION

TEPP LLC concludes that:

- sight distances are appropriate for the Woburn Street/425 Woburn Street driveway intersection and the existing driveway is appropriate for the anticipated uses
- the proposed redevelopment will have low trip generation with a no significant impact on traffic safety and operations
- these findings apply considering the two planned background developments